

Appl. No. 10/538,525
Amdt. Dated June 20, 2007
Reply to Office Action of May 9, 2007

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Listing of Claims:

1. (currently amended) An X-ray source comprising:
 - an electron source for the emission of electrons,
 - a target for the emission of characteristic, substantially monochromatic X-rays in response to the incidence of the electrons, said target comprising a metal foil of a thickness of less than 10 μ m and a base arrangement for carrying said metal foil, wherein the metal of said metal foil has a high atomic number allowing the generation of X-rays and the material substantially included in the base arrangement has a low atomic number not allowing the generation of X-rays, and
 - an outcoupling means, which generally only transmits X-rays propagating in the reflection direction of the metal foil, for outcoupling the X-rays on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement,

wherein said base arrangement comprises a rotatable base plate of a material having an atomic number of less than 10.
2. (cancelled)
3. (previously amended) The X-ray source as claimed in claim 1, wherein said base arrangement comprises a cooling circuit arranged to allow a coolant to flow along the side of said metal foil opposite to the side on which the electrons are incident.
4. (previously amended) The X-ray source as claimed in claim 3, wherein the coolant has a mean atomic number of less than 10.
5. (previously amended) The X-ray source as claimed in claim 3, wherein the coolant is water.

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6. (previously amended) The X-ray source as claimed in claim 3, wherein said cooling circuit comprises a constriction in the area of the metal foil.
7. (previously amended) The X-ray source as claimed in claim 3, wherein said target further comprises a carrier of low atomic number material supporting the metal foil on the side facing the coolant.
8. (previously amended) The X-ray source as claimed in claim 1, wherein the metal foil has a thickness of less than $5\mu\text{m}$.
9. (previously amended) The X-ray source as claimed in claim 1, wherein the metal of said metal foil has an atomic number between 40 and 80.
10. (previously amended) The X-ray source as claimed in claim 1, wherein said outcoupling means is adapted to outcouple X-rays at angles of an angular range from substantially 45° to 135° , to the surface of the metal foil.
11. (previously amended) The X-ray source as claimed in claim 1, wherein said outcoupling means is adapted to outcouple X-rays in a direction substantially antiparallel to the direction of incidence of said electrons.
12. (previously amended) The X-ray source as claimed in claim 1, wherein said electrons are directed onto the surface of said metal foil at a substantially 90° angle.
13. (previously amended) The X-ray source as claimed in claim 1, wherein said electron source is located outside the X-ray beam to be outcoupled, said X-ray source further comprising means for directing the electron beam onto the metal foil.

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14. (currently amended) A target for use in an X-ray source for the generation of characteristic, substantially monochromatic X-rays in response to the incidence of electrons, said target comprising a metal foil of a thickness of less than 10 μ m and a base arrangement for carrying said metal foil, wherein the metal of said metal foil has a high atomic number allowing the generation of X-rays and the material substantially included in the base arrangement has a low atomic number not allowing the generation of X-rays, and
wherein said base arrangement comprises a rotatable base plate of a material having an atomic number of less than 10.

15. (currently amended) An X-ray source comprising:

- an electron source for the emission of electrons, and
- a target for the emission of substantially monochromatic X-rays in response to the incidence of the electrons, said target comprising a metal foil of a base arrangement, said metal foil allowing the generation of X-rays and the base member not allowing the generation of X-rays,

wherein said base arrangement comprises a cooling circuit to allow a coolant to flow along the side of said metal foil opposite to the side on which the electrons are incident, and

wherein said target further comprises a carrier having a mean atomic number of less than 10 supporting the metal foil on the side facing the coolant.

16. (cancelled)

17. (previously amended) The x-ray source as claimed in claim 15, wherein the coolant is water.

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18. (previously amended) The x-ray source as claimed in claim 15, wherein said cooling circuit comprises a constriction proximate the metal foil.
19. (cancelled)
20. (previously submitted) The X-ray source as claimed in claim 1, wherein said outcoupling means is adapted to outcouple X-rays in a direction at an angle in the range from 150° to 210° to the direction of incidence of said electrons.